

CLAIMS

What is claimed is:

- 1 1. A method for tracking mobile objects along a target path, comprising:
2 identifying a plurality of way-points along the target path;
3 processing a position measurement of at least one object;
4 computing a distance parameter between said position measurement and at least
5 two of said way-points;
6 defining a road segment between two of said way points closest to said position
7 measurement; and
8 linearly constraining said measurement position to said road segment and
9 computing a regional measurement.
10
- 1 2. The method according to claim 1, further comprising determining a likelihood that said
2 position measurement is within a range of said target path, and computing said position
3 measurement without said linearly constraining if said position measurement is outside
4 said range.
5
- 1 3. The method according to claim 2, wherein said range is a chi-square threshold.
2
- 1 4. The method according to claim 1, wherein said way-points are position coordinates are
2 selected from at least one of the group consisting of: pre-determined geographical
3 positions and dynamically derived geographical positions.
4
- 1 5. The method according to claim 1, wherein said position measurement is derived from
2 triangulating a set of bearing lines from at least two sensors that detects said object.
3
- 1 6. The method according to claim 1, wherein said computing employs at least one
2 uncertainty variable, said uncertainty variable selected from at least one of the group
3 consisting of: a set of road way-point uncertainties and a measurement covariance.
4

- 1 7. The method according to claim 1, further comprising applying said regional
2 measurement to a tracking filter.
3
- 1 8. The method according to claim 7, wherein said tracking filter is selected from at least
2 one of the group consisting of: a variable gain filter and a constant gain filter.
3
- 1 9. The method according to claim 1, wherein said processing said position measurement
2 is transmitted from a repeater.
3
- 1 10. An apparatus for tracking at least one mobile target, comprising:
2 a communications section;
3 a memory device; and
4 a microprocessor coupled to said communications section and said memory device,
5 wherein said microprocessor comprises a constrained measurement unit, and an
6 estimator, wherein a target position measurement is linearly constrained by said
7 constrained measurement unit prior to processing by said estimator.
8
- 1 11. The apparatus according to claim 10, wherein said microprocessor further comprises a
2 fusion section that processes said target position measurement from a set of sensor
3 measurements received by said communications section.
4
- 1 12. The apparatus according to claim 10, further comprising a global positioning system
2 coupled to said microprocessor.
3
- 1 13. The apparatus according to claim 10, wherein said estimator employs a filter selected
2 from at least one of the group consisting of: a variable gain filter and a constant gain
3 filter.
4
- 1 14. A system for tracking at least one mobile target in a region along a target path having
2 way-points, comprising:
3 a plurality of sensors deployed in the region, wherein said sensors detect said
4 mobile target;

5 a first processing section that receives target data from said sensors and processes
6 target localization information;
7 a second processing section wherein said target localization information is linearly
8 constrained and generates a regional measurement; and
9 a third processing section that filters said regional measurement and generates a
10 filtered target position.
11

1 15. The system according to claim 14, wherein said target data from said sensors is at least
2 two bearing lines and said target localization information is processed using
3 triangulation from said bearing lines.
4

1 16. The system according to claim 14, wherein said filtered target position updates a target
2 track.
3

1 17. The system according to claim 14, wherein said third processing section employs a
2 tracking filter selected from at least one of the group consisting of: a variable gain
3 filter and a constant gain filter.
4

1 18. The system according to claim 14, wherein said filtered target position is
2 communicated to a central processing center.
3

1 19. The system according to claim 14, wherein said target path has a threshold bounds and
2 if said target localization information is outside said threshold bounds, said target
3 localization information is not linearly constrained and said target localization
4 information establishes a non-constrained target position.
5

1 20. The system according to claim 14, wherein said first processing section receives target
2 data from at least one repeater unit that communicates with said sensors.
3